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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/679,545 | 10/06/2003 | Michael S. Choi | 06558/011002 | 3325 |

7590 04/10/2007
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| EXAMINER |
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BUCHANAN, CHRISTOPHER R

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| ART UNIT | PAPER NUMBER |
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3627

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|--|------------|---------------|
| 3 MONTHS | 04/10/2007 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/679,545

Applicant(s)

CHOI, MICHAEL S.

Examiner

Christopher R. Buchanan

Art Unit

3627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-5 and 7-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 3-5 and 7-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 3-5, 7-15, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson (GB 1,596,330) in view of Moore (US 6,062,313).

Regarding claims 3, 13, and 17, Thompson discloses a method, system, and apparatus for developing a sub-sea hydrocarbons field including producing hydrocarbons, including gas and oil, from the field (page 1 lines 16+), conveying the gas to a vessel (page 1 col. 55), liquefying natural gas aboard a vessel using a liquid coolant aboard the vessel to obtain liquefied natural gas (page 1 lines 56-63), transporting the liquefied natural gas to a remote terminal (page 2 lines 43+), re-gasifying the liquefied natural gas (page 3 lines 9+), and obtaining a new batch of liquid coolant using energy recovered from the re-gasifying the liquid natural gas (page 3 lines 24-27).

Thompson fails to disclose de-gasifying hydrocarbons (i.e., permanently separating gas from hydrocarbons) obtained from the sub-sea hydrocarbons field to produce oil and gas and conveying the produced oil to a rigid storage tank on the seabed.

Moore discloses a method and system for developing a sub-sea hydrocarbons field that includes de-gasifying hydrocarbons obtained from the sub-sea hydrocarbons field to produce oil and gas (column 6 lines 29-35, column 5 lines 20-25), and conveying and storing the produced oil to a storage tank (40) on the seabed (Fig. 1) (claims 3, 13 and 17). Moore shows the storage tank to be flexible, however, it would be obvious to one skilled in the art that the tank could be constructed in a variety of manners as required for proper operation of the system. Whether the tank is flexible or rigid would be a matter of design choice.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method and system of Thompson to include fluid separation and seabed oil storage, as taught by Moore, because most natural gas fields have associated oil production that must be stored or piped to shore (Thompson; page 16-19), and seabed tanks provide an economical, environmentally-safe, and transportable storage means. Furthermore, it is well-known and common practice to separate the production hydrocarbons into gaseous and liquid (oil) components and to transport and store them as necessary.

Regarding claims 4 and 14, the method includes conveying separated gas to the vessel via a riser (page 2 line 35+). Regarding claims 5 and 15, Thompson discloses pre-treating the produced gas at a natural gas pre-treating facility before liquefying (page 1 lines 69-75). Regarding claim 7, Thompson discloses liquefying a new batch of natural gas using the new batch of liquid nitrogen aboard the vessel (page 2 lines 48-51). Regarding claim 8, Thompson discloses one of a plurality of storage tanks aboard

the vessel is inherently empty to receive an initial portion of the liquefied natural gas (page 2 lines 43-45). Regarding claim 9, Thompson discloses that the re-gasifying the liquid natural gas is performed at the remote terminal (page 2 lines 77-78 and page 3 lines 9-17). Regarding claim 10, Thompson discloses that the re-gasifying of the liquefied natural gas produces high pressure gas (page 3 lines 17-22). Regarding claim 11, Thompson discloses the method further comprises sending the high pressure gas to a pipeline (page 3 lines 30-34). Regarding claim 12, Thompson discloses transporting the liquefied natural gas to the onshore terminal is performed using the vessel (page 2 lines 45-46). Regarding claim 18, the new batch of coolant is liquid nitrogen (page 2 lines 40-48).

3. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson (GB 1,596,330) in view of Moore (US 6,062,313) and further in view of Giannesini et al. (US 5,295,546).

The combination of Thompson and Moore disclose a system for developing an oil and gas field as described above, but fail to disclose a power and control buoy configured to provide electric power and control functions for the sub-sea separation system.

Giannesini discloses a system for developing an oil and gas field that includes a power and control buoy configured to provide electric power and control functions for sub-sea operations (column 7 lines 1-8).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Thompson and Moore to include a power and control buoy in the system, as taught by Giannesini, because providing power and control via a buoy allows for continuous electrical power to sub-sea operations even when the vessel is transporting liquefied natural gas to shore. Furthermore, it is well-known and common practice in the art to use power and control buoys to provide electric power and control functions for sub-sea operations.

Response to Arguments

4. Applicant's arguments filed January 12, 2007 have been fully considered but they are not persuasive.

Applicant argues the prior art used in the rejection do not disclose the claimed features of the invention. In particular, applicant argues that the prior art does not show a sub-sea hydrocarbons field producing gas and oil, permanently separating the gas from the produced hydrocarbons, or conveying the hydrocarbons to a rigid storage tank.

The examiner disagrees and stands by the rejection above. Thompson discloses that the sub-sea field produces both gas and oil (page 1 line 16+). Although Thompson does not explicitly show separating the gas and oil, it is inherent that this operation is performed, since gas is recovered, and Thompson does not show this gas to be re-introduced into the oil-- i.e., the separation is permanent. The Moore reference is used to explicitly show the separation of the gas and oil, not to suggest any further processing of the gas. Any further processing of the gas would be a matter of design

Art Unit: 3627

choice. Moore shows the storage tank to be flexible, however, it would be obvious to one skilled in the art that the tank could be constructed in a variety of manners as required for proper operation of the system. Whether the tank is flexible or rigid would be a matter of design choice.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher R. Buchanan whose telephone number is 571-272-8134. The examiner can normally be reached on Mon.-Fri. 9:00am - 5:30pm.

Art Unit: 3627

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ryan Zeender can be reached on 571-272-6790. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CB

Andrew Joseph Rudy
Primary Examiner, AU 3627